

**Listing of Claims:**

Claims 1-30 (Canceled).

31. (New) A method for simulating an electric network including a plurality of circuit elements connected by a plurality of wiring lines, said method comprising:

defining electric functions of the plurality of circuit  
5 elements as a plurality of element cells;

defining intersections of the wiring lines at which at least three of the circuit elements are connected as intersection cells;

defining as a plurality of pipes, wiring lines extending  
10 between any of: (i) an element cell and another element cell, (ii) an intersection cell and another intersection cell, and (iii) an element cell and an intersection cell;

setting respective rules of transfer of particles through the element cells based on respective types of the element cells,  
15 and setting respective rules of transfer of particles through the intersection cells;

performing transfers of the particles through the element cells and the intersection cells based on the respective rules;

repeating the transfers until a predetermined convergence  
20 condition is satisfied at which a respective number of particles in each of the pipes is substantially steady and a respective

number of particles moved through each of the element cells and intersection cells is substantially steady; and

determining the number of particles in each of the pipes and the number of particles moved through each of the element cells and each of the intersection cells when the predetermined convergence condition is satisfied.

32. (New) The method according to claim 31, further comprising:

determining voltages in the electric network based on the determined number of particles in each of the pipes; and

5 determining currents in the electric network based on the determined number the particles moved through each of the element cells and intersection cells.

33. (New) An apparatus for simulating an electric network including a plurality of circuit elements connected by a plurality of wiring lines, said apparatus comprising:

5 a defining unit configured to: define electric functions of the plurality of circuit elements as a plurality of element cells, define intersections of the wiring lines at which at least three of the circuit elements are connected as intersection cells, and define as a plurality of pipes, wiring lines extending between any of: (i) an element cell and another element cell,

- 10 (ii) an intersection cell and another intersection cell, and  
(iii) an element cell and an intersection cell;

a setting unit configured to set respective rules of transfer of particles through the element cells based on respective types of the element cells, and to set respective  
15 rules of transfer of particles through the intersection cells;  
and

a determining unit configured to: (i) perform transfers of the particles through the element cells and the intersection cells based on the respective rules, (ii) repeat the transfers  
20 until a predetermined convergence condition is satisfied at which a respective number of particles in each of the pipes is substantially steady and a respective number of particles moved through each of the element cells and intersection cells is substantially steady, and (iii) determine the number of particles  
25 in each of the pipes and the number of particles moved through each of the element cells and each of the intersection cells when the predetermined convergence condition is satisfied.

34. (New) The electric network simulating apparatus according to claim 33, further comprising a second determining unit configured to: (i) determine voltages in the electric network based on the determined number of particles in each of  
5 the pipes, and (ii) determine currents in the electric network

based on the determined number the particles moved through each of the element cells and intersection cells.

35. (New) A storage medium having a simulation program stored thereon for causing a computer to simulate an electric network including a plurality of circuit elements connected by a plurality of wiring lines, said simulation program causing the  
5 computer to perform the steps of:

defining electric functions of the plurality of circuit elements as a plurality of element cells;

defining intersections of the wiring lines at which at least three of the circuit elements are connected as intersection  
10 cells;

defining as a plurality of pipes, wiring lines extending between any of: (i) an element cell and another element cell, (ii) an intersection cell and another intersection cell, and (iii) an element cell and an intersection cell;

15 setting respective rules of transfer of particles through the element cells based on respective types of the element cells, and setting respective rules of transfer of particles through the intersection cells;

performing transfers of the particles through the element  
20 cells and the intersection cells based on the respective rules;

repeating the transfers until a predetermined convergence condition is satisfied at which a respective number of particles

in each of the pipes is substantially steady and a respective  
number of particles moved through each of the element cells and  
25 intersection cells is substantially steady; and

determining the number of particles in each of the pipes and  
the number of particles moved through each of the element cells  
and each of the intersection cells when the predetermined  
convergence condition is satisfied.

36. (New) The storage medium according to claim 35,  
wherein the simulation program causes the computer to perform the  
further steps of:

determining voltages in the electric network based on the  
5 determined number of particles in each of the pipes; and

determining currents in the electric network based on the  
determined number the particles moved through each of the element  
cells and intersection cells.